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B.A.DEGREE COURSE  
THIRD YEAR  
APPLICATION ORIENTED SUBJECT  
Teaching Aids and  
their applications in Music  
Common to English & Tamil Medium  
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UNIVERSITY OF MADRAS  
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## Teaching Aids and their applications in Music

- I General survey of Teaching aids used in education. Outline knowledge of - Graphic representation, photographs, mechanical aids and models, electronic aids.
- II Scope of aids in the teaching of Theory of music and Practical.
- III Detailed study of the application of -
  - a) Charts, Albums, Maps, Photographs
  - b) Demostration musical instruments (pradarsana vina), metronome.
  - c) Electronic Audio, Video Equipments; Electronic talometre
  - d) Computer.

## SCHEME OF LESSONS

## Lesson

## no.

- 1 General survey of Teaching aids used in education. Outline knowledge of - Graphic representation, photographs, mechanical aids and models, electronic aids.
- 2 Scope of aids in the teaching of Theory of music and Practical.
- 3 Detailed study of the application of -
  - a) Charts, Albums, Maps, Photographs
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- 4 Detailed study of the application of -  
Electronic Audio & Video Equipments; Electronic talometre
- 5 Detailed study of the application of  
Computer

## OVERVIEW

This package of learning material contains lesson no.1,2 & 4.

## LESSON No. 1

General survey of Teaching aids used in education.

## Outline knowledge of -

1. Graphic Representation
2. Photographs
3. Mechanical Aids and Models
4. Electronic Aids.

Education is imparting instructions to one for the purposes of his learning. There are roughly three factors involved in this - the act of teaching, the act of learning and the subject that is being taught. The act of teaching is primarily done by a human being knowledgeable in that subject. The act of learning again is by a human being eager to acquire the knowledge of the subject. The subject, of course, is varied -- reading, writing and speaking a language, mathematics, the fine arts, sports, physical sciences, social sciences, humanistic sciences, biological sciences, engineering, medicine - the list can go on endless. In fact anything can become the subject of teaching and learning, as for instance cooking, driving and even fighting and meditating. This paper on Teaching Aids in Music will concern itself mainly with the first aspect of education, namely the teaching.

In the act of teaching, a teacher is communicating the subject to a student. The mode of communication is primarily verbal. That is, the teacher will speak. Speaking implies communicating through a language commonly understood by the teacher as well as the student. Thus all communication is done primarily through language, words etc. For the purpose of greater understanding and clarification a teacher might resort to giving analogies and even stories. These are devices to enable those students to understand who have not been able to grasp the teaching fully. Here the analogies and stories, in a way, become aids to teaching.

And sometimes the teacher would write important technical terms on the black-board. Now writing becomes the first step outside the oral communication. Different forms of lines and curves drawn on paper or black-board 'represent' spoken words and come to be called written words or simply writing. A written word makes a visual impact on the student and would aid the assimilation of the 'spoken word'. And the next of step of the student 'copying' the written word or 'writing down' the spoken words of the teacher would be a permanent and concrete record of the speech. The speech which would, otherwise have been recorded only in the memory of the student, gets recorded in a different medium, namely the script. Thus writing becomes an 'aid' to teaching.

If suppose there is a lesson on fruits and the teacher is describing apple to a class of students which has not seen one. If for the students to get an understanding of the shape and size of an apple, the teacher draws the figure on the black-board and spreads out the fingers of his hand to give an idea of the size, the drawing on the black-board and the movement of the fingers become 'aids'. Now the aids here are of a kind different from what we encountered earlier. That is in this case we have transcended the medium of language and entered a purely visual medium.

Thus roughly the aids to teaching could be broadly classified into two -

a) those which merely record the spoken communication in employing mechanical, electrical, electronic means etc. e.g., written scripts, printed notes, notations, xerox copies etc., audio-taped speeches, audio-taped classes, video-taped classes. Thus what ever is communicated in a class is capable of being recorded for the purpose of 're-vision' later by means of writing, audio and video recordings.

b) those which are non-speech and non-language medium and serve as auxiliary modes for communicating for the purpose of better understanding. e.g., drawing of graphs, charts etc. Through these aids, the idea contained in a subject is sought to be expressed not through language but some other medium of communication. If, for instance, a graph is drawn between number of balls and the number of runs scored by a team in a one cricket match, then one gets a better understanding of the progress of the match, than by merely listening to the narration of the progress of the events. Graph in this case is an additional aid and is not a substitute instructing medium.

hence we shall briefly survey the kinds of aid that are used in education.

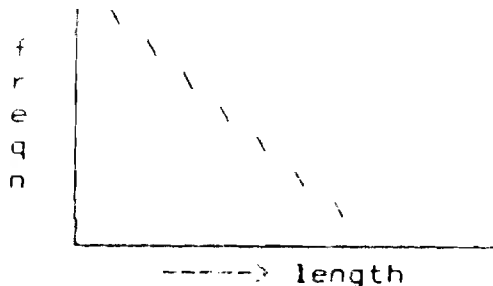
#### 1. Graphic Representation :

Graphic representation can be understood in the general sense of visually portraying certain facts and also in the particular sense of the relation between two variables in an event. Charts, tables etc. are graphic in a general sense. Instead of speaking out the names of svarasthAna-s if the diagram of the frets of a vina or white-black keys set of harmonium/piano is drawn and the position of the svarasthAna-s are marked then it becomes easy to understand.

Diagrams are drawn in text books to illustrate certain physical phenomena like expansion of solids and liquids through heat. These aid in the understanding of written accounts. However the same idea could be illustrated through experiments also involving apparatus from laboratory. These experiments would, of course, supplement a spoken lecture.

Both for spoken lectures and for written notes diagrams and other forms of illustrations are very useful and necessary additions.

**Graphs :** Graphs are drawn between two variables, like for instance, between the length of a string and the frequency of the sound produced. The graph, in a simple form, has one vertical axis and one horizontal axis. If we keep length of the string on horizontal and frequency on the vertical, with the lowest value as the meeting point. The resultant graph will then be something like this -



## 2. Photographs

Photographs are used where the real object is not available or cannot be presented for exhibition. If there is a lecture on musical instruments and a North Indian instrument like santura is being described, then if the real instrument is not available a photograph will aid in the understanding of the instrument. If a piano is being described and in spite of it being available if it is not possible to transport it to the place of class then a photograph would help.

In written documents also photographs should be introduced wherever possible.

## 3. Mechanical Aids and Models

Two experimentally demonstrate certain physical phenomenon and facts mechanical aids and models are used. For instance, a sonometre is a mechanical aid used to demonstrate the laws of stretched strings.

In a subject like geography, to explain the solar system, in addition to drawings, models of the system are built and used. In chemistry, for instance, to explain the structure of organic compounds models are constructed and used, or in genetics, for instance, models are used to explain the structure of DNA, RNA etc.

## 4. Electronic Aids.

Once we come to advanced non-mechanical aids like electrical, electronic and computerised aids then the world of teaching aids becomes very large. At this level the aids

not only aid in understanding but also serve the purpose of establishing contact of the teacher with a wider and distant audience. As for instance the Radio. For instance, music lessons are being given through radio thus reaching a large audience. This is useful where the learner and teacher are separated by distances and personal contact is not possible.

Even in case where there personal contact does exist, there may be limitations as to the period of contact. It may be possible for a teacher to meet a pupil only once a week and period of non-contact could be made up by use of electronic aids like audio tape-recorder, video tape-recorder etc. If, for instance, a song is taught in a class, the teacher could supply the tape-recording and notation, and expect the student to come back for the next class having learnt the song fairly satisfactorily with the help of the aids. The shortcomings, if any, could be rectified during the next contact hour.

Over-projector facility has removed the effort of having to write on the board or having to go to the board. Whatever is to be drawn on the board is already prepared on a transparent sheet and is projected. The time taken to write is saved. The illuminated projection is brighter and clearer. And if any thing has to be supplemented by way of writing during the class, it can still be written on the sheet and project. This way the subject is more conspicuous and the teacher less.

Slide projectors help project photographs, just as Over-head projectors project, written matter, charts, diagrams etc.

The electric/electronic aids thus are many -- Over-head projector, Slide projector, radio, audio tape-recorders, film projectors, video-recorders, computers incorporating multi-media etc.

### Conclusion

The scene in the field of education has changed tremendously in the recent years with the incorporation of technological gadgets into education. Spoken lecture is gradually ceasing to be the dominant medium of communication. Other media are being encouraged to be incorporated in the system of imparting instruction. The role of a teacher is changing from one who is the deliverer of knowledge to one who operates and controls the different media of communication of knowledge. Perhaps a day would come when the teacher would himself be an aid to help the student in organising the different media for acquiring the knowledge of a subject.

## Scope of Aids in the Teaching of Theory of Music and Practical

Music is primarily a performing art and is non-discursive in nature. It has to be learnt directly and not through the medium of language. Theory of Music on the other hand is knowledge about music or description of the performed music through the medium of language. Since the two, music and theory of music, differ with respect to their nature, the teaching of the two also differ. And consequently the teaching aids are employed differently in the two areas.

### Music Practical :

Music as mentioned above is performed and directly communicated to the learner and learner absorbs it directly. There should not be any need of any speech or verbal explanation accompanying music teaching. Classes in music could be held totally free of any spoken words. However to help so those who are slightly slow in grasping or not regular in practising aids are required.

#### a) Notation

Notation is translating music from a sound form to a script or written form. This corresponds to the role that writing plays in the sphere of verbal communication. However musical notation is not as advanced or as capable as the language writing. Even in the case of language a written passage may not be able to convey the tone or accents or emphasis given by a speaker through the voice. However writing has developed some devices to make up for this. But in the case of music, especially Indian Music, the notation by itself cannot convey the musical structure. In the case of Western music the music and notation have got standardised with respect to one another and there is one to one correspondence between the written notation and the performed music. In the case of South Indian Music, the notation is used for transmitting music but as an aid for recording and helping the memory to recollect later the music. In this way it also help preserve music. If, of course, by any chance a musical composition does not exist in practice then it is not possible to reconstruct its original form with the help of the notation.

#### b) Radio

This is an electrical method for transmitting music to reach distant audiences. This is a useful aid for teaching music lessons and is being done so. The disadvantage of

course is the impossibility of teacher to correct the mistakes of the invisible students.

However with the available modern technology, radio-conferencing is possible where a teacher to interact through radio with the students in the class. This would give the teacher the facility to correct mistakes.

c) Gramophone records or Discs :

This started as a mechanical device by which sound could be recorded and reproduced. A student of music could supplement his music lessons with hearing of music recorded on Discs. Earlier days students had to go to live public performances to listen to other music.

In the case of disc, even though there is a possibility of learning a song from a disc, it is not advisable to attempt it unless supervised by the teacher.

Disc players, changed from mechanical to electrical driven ones. They became electronic controlled and now we are in the age of Compact Disks in which sound is reproduced through laser beams. Nowadays Compact Disks also support video and computer informations.

d) Audio Tape-Recorder :

This also is a device to record and reproduce sound, it is an improvement on disc in that the recording could be done by the user himself. In the case of discs the music is recorded by the recording company. In tape recorders there exists the facility to erase the music recorded on a tape and re-use it for recording fresh music. Tape-recorders are of two kinds - those with tapes coming in open spools and those with tapes in enclosed plastic cassettes.

With the help of a tape recorder it possible to transfer into another medium the music rendered by a teacher and which can be reproduced later at leisure. It is an improvement on notation since notation cannot reproduce the music in sound form. Apart from using the tape recorder for recording the music learnt, a teacher could before hand supply the song he is going to teach and ask the student to come prepared with that. This method would help speed up the process of teaching and learning. If a notation is supplied, in addition, then the teaching process would be hastened still.

e) Audio-Visual Equipments : Film and Video tape-recorder.

Film : Film could be, in a way compared to the gramophone discs. Moving actions along with sound are recorded on a film and then projected on a screen. But just as discs these are already done by movie cameras at locations and processed in studios. It is not possible for the user to change or edit a film once processed or reuse it.



Performances of music can be filmed and projected. Advantage in this area, of course, lies in the filming of performances on musical instruments. This would enable a student to watch the techniques of hand and other limbs employed by the artist.

Video-recorder : This corresponds to the audio tape-recorder but incorporates the visual element also. This can be used in the same way as an audio tape recorder especially by the students of musical instruments. Video recorders have the facility to run tape at slow speeds such that the visual moves frame by frame. There is also facility to freeze or still the picture.

In Compact Discs there is facility to move from one portion to any other portion instantaneously.

tambUrA/ Sruti box : A question may be asked if tambUrA is an aid or necessary ingredient of music performance. The purpose of the tambUrA is help the performer to stay aligned to the Sruti. To some extent it is a musical aid if not a teaching aid.

Metronome and tAlOmetre : Metronome is a mechanical device which gives sounds at regular time interval. The time interval can be increased or decreased. It is a device used in Western Music. Although the use to which it is put there is of a totally different nature it could be used by students here to help gain control over kAla-pramANa.

tAlOmetre is a computerised electronic instrument which renders the tAla-s used in our music at the required tempo. It is useful for gaining control over kAla pramANa in rendering the tAla. It is also useful for players on musical instruments who cannot use their hands for rendering tAla. Even the singers use it as a support to stay aligned to the tAla and kAla pramANa.

#### Music Theory :

Music theory is primarily understanding the performed music. However its scope gets enlarged. And as mentioned earlier the medium of communication is language. And hence all the kinds of aids referred to lesson no. 1 are applicable here. They will be listed again and examples will be added.

The areas covered under theory would roughly be --

1. Pure theory- Musical Forms, tAtu, vAtu, kAlapramANa, tAla
2. Understanding of notation
3. Study of Composers and musicians
4. Study of Musical Instruments
5. History of Music
6. Folk, devotional music and music used in other arts.

## Aids :

1. Charts, graphs, photographs -- See lesson no.3
2. Mechanical Aids - e.g. Sonometre for demonstrating acoustical principles.
3. Radio - e.g. Radio talks on theoretical topics
4. Gramophone discs - e.g., playing songs as illustrations during discussion of rAga-s, tAla-s, musical forms, styles of composers, styles of musicians.
5. Audio-tape recorder - e.g. recorded illustrations of music when live music is not possible. A tape recorder is an indispensable part of a theory class.
6. Film and Video recorder -  
e.g. to accompany lectures on construction and playing musical instruments; folk music involving dancing by participants.
7. Slide and Over-head Projectors - e.g. to accompany lectures on musical instruments, to project notated examples, to project charts, photographs etc.

## LESSON No. 4

Detailed study of the application of

1. Electronic Audio & Video Equipments
2. Electronic Talometre

This covers the electronic equipments used in music --

- a) Audio Tape-recorder
- b) Video Tape-recorder
- c) Electronic musical instrument - Sruti Box
- d) Electronic musical instrument - tambUrA
- e) Electronic musical instrument - tAlOmetre

a) Audio Tape-recorder :

This has been discussed to some extent in lesson no.2. Although gramophone discs and compact discs also come under electronic audio equipments they do not have the facility to erase and re-record.

Application of Audio Tape Recorder (ATR) in music teaching can be done in many ways.

The simplest form of application is to record a song that a teacher is teaching. This helps preserve the song in an audio form so that the students refer back to it again and again during his practice sessions.

The next is for the teacher to before hand record the song and hand the tape to the student and ask him to come prepared for the class. In this way the student is already preprepared to receive a new lesson and his power of grasping, interest due to familiarity will be more. Hence the pace of learning will be accelerated. As mentioned earlier this will be helpful when the teacher and the student are not able to meet each other as often as possible.

Third method of application is for the teacher to sing a particular line twice and then leave gap in the tape for the student fill in. The students should take the tape home and fill the gap by repeating the music that preceded the gap. In the subsequent class the teacher will be able to listen and point out the mistakes to the students and correct him. This method could be used to teach even mew varisai-s where the first line could be sung by the teacher and the remaining left for the students to fill in.

The fourth way - If the student has been taught two songs in a particular rAga then the teacher could record and give him a third song in the same rAga ( with the notation also supplied) and ask him to learn the song by himself.

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Thus at slightly advanced stage a percentage of the syllabus should be left for the student to learn by himself. This will make the students more self sufficient and develop the ability to draw upon their own resources. The student will become more active participant and less passive.

b) Video Tape Recorder :

This can be applied in the ways suggested for ATR above. And as mentioned earlier this is useful where the visual element is also required, as in the case of instrumental playing.

In addition the performance, vocal or instrument, of a student could be video-recorded and played back to him and faults pointed out. In disciplines like music, audio and video playback of performance are very essential for a students to discover and realise his faults. Otherwise students usually do not become aware of their faults.

c) Electronic musical instrument - Sruti Box

A Sruti-Box is a mechanical aid for a musician to stay aligned to Sruti. The Sruti box sounds the AdhAra-sa, madhya-pa and tAra-sa together. With the external reference the musician is able to correct himself and prevent himself from slipping.

Electronic Sruti box is an electronic version of it. The advantages are many -

- i. One need not operate it with hand and is automatic. It runs on electricity and in its absence on battery.
- ii) It can be tuned to any desired Sruti - Lower-A to High-C. The earlier mechanical version had normally facility for tuning only three Sruti-s (e.g. F#, G, G#).
- iii) Some electronic Sruti-boxes have automatic tuning so that tuning sa-pa-SA is automatically done. Thus beginners who are not yet trained in the technique of tuning may be assured that their Sruti is not apaSruti.

d) Electronic musical instrument - tambUrA

This is an electronic version of the wooden body cum metallic strings tambUrA. The sound this produces resembles the wooden one to great deal. It has the facility to change of the tempo of plucking also.

The electronic tambUrA has all the advantages enumerated for the electronic Sruti box. In addition it has also the advantage of portability which the large sized wooden tambUrA does not have. Present day improved version of this tambUrA has been able to incorporate the buzzing sound obtained in a wooden tambUrA through the jIvA thread.

## e) Electronic musical instrument - tAlOmetre

This, as mentioned earlier, is a very useful teaching as well as practice aid.

This instrument visually and aurally projects the tAla. The kriyA-s of the tAla are indicated through light-emitting-diodes (LED) as well as through sounds. The colour of the light for taTTU and finger counts are different from that for vIccu. Again the sound quality for vIccu and fingers are different from those for taTTu. In this way one can use the instrument listening only to the sound or with the volume of the sound turned to zero.

There is facility to get the kriyA beeps sounded at the Sruti to which the musician is performing. In this way the beep sounds would not jar and would blend with the music.

Both the sets of tAla-s, the 35-tAla-s and the non 35 ones like cApu are obtained in this. There is 'MUTE' switch which enables one to dampen the sound accompanying the niHSabda kriyA-s. This facility comes in useful for obtaining the cApu tAla-s from the related 35 tAla ones. For instance, by dampening the niHSabda kriyA-s in the tiSra rUpaka tAla one can obtain the khaNDa-cApu tAla.

There is a facility to vary the kAla-pramANA of the tAla from very large to very small. Thus one can obtain a tAla in oru-kAlai or in nAlu-kAlai.

There is also a facility available to have naDai. naDai-s of 3, 4, 5, 6, 7, 8 and 9 are possible. When, for instance, Adi tAla is set with 3-naDai then a student can practise variSai-s in tiSra naDai. Once he gets control over the naDai then he could practise without switching on the naDai button.

There is a facility also for programming naDai-s such that the different naDai-s could recur in a desired sequence. Thus one could have the first Avarta of AditAla in 3-naDai, second in 4-naDai, third in 5-naDai etc.

Finally there is facility to shift the point of commencement of the tAla. It is called 'DELAY'. By this, for instance, the Adi-tAla could be made to start on the vIccu of the 2nd druta, or on the taTTu of the 2nd druta, or on the vIccu of the 1st druta and thus the starting point gradually shifted to an earlier kriyA. Through this process actually we are 'delaying' the first kriyA. This facility is useful when the performer requires a few mAtra-kAla for settling before commencing with start of the Avarta.

In this way the tAlOmetre has many facilities and is useful for the teacher and the student to achieve good progress in music learning.